

**AMERICAN VACUUM SOCIETY NATIONAL SYMPOSIUM
October 14-18, 1996
Philadelphia, Pennsylvania
Session MI3: Magnetic Core-Level Spectroscopy and Dichroism**

**DIRECT COMPARISON OF MAGNETIC X-RAY CIRCULAR AND LINEAR DICHROISMS IN
HIGH RESOLUTION PHOTOELECTRON SPECTROSCOPY**

**J.G. Tobin, K.W. Goodman
Lawrence Livermore National Laboratory, Livermore, CA**

**F.O. Schumann, R.F. Willis
Pennsylvania State University, University Park, PA**

**W.J. Gammon, D.P. Pappas
Virginia Commonwealth University, Richmond, VA**

**J.B. Kortright, J.D. Denlinger, E. Rotenberg, A. Warwick, N.V. Smith
Lawrence Berkeley Laboratory, Berkeley, CA**

A direct comparison of Magnetic X-Ray Circular Dichroism (MXCD) and Magnetic X-Ray Linear Dichroism (MXLD) in high resolution, angle-resolved photoelectron spectroscopy has been performed. Crucial to the experiments was the development and implementation of a novel transmission multilayer that serves as a soft x-ray phase retarder (quarter wave plate.) Measurements were performed upon the Fe3p core levels in NiFe/Cu(001) and the Gd4f core levels in Gd grown on Y. Strong circular dichroic effects were observed in the normal emission spectra of both the Fe3p and Gd4f states. Comparison between these MXCD results and the normal emission MXLD spectra collected from the same samples will be made. In the case of the fourfold symmetric NiFe/Cu(001), the experimental geometries are essentially identical and provide for an exact comparison of the two techniques. These measurements were made at the Spectromicroscopy Facility (Beamline 7) of the Advanced Light Source at LBNL.

This work was done under the auspices of the U.S. Department of Energy by Lawrence Livermore National Laboratory under contract number W-7405-ENG-48. The Spectromicroscopy Facility and the Advanced Light Source were constructed and are operated under the support of the U.S. Department of Energy.